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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

INSPECTOR-PACKER (pottery and porc.) 6-66.913

B-535 S-258

001 769

U. S. Employment Service in
Cooperation with
Tennessee State Employment Service

May 1963

GATB # 2431

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

INSPECTOR-PACKER (pottery and porc.) 6-66.913

B-535

Summary

The General Aptitude Test Battery, B-1002B, was administered to a final sample of 50 workers employed as Inspector-Packers 6-66.913 by the American Lava Corporation, Chattanooga, Tennessee. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes P-Form Perception, K-Motor Coordination, and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Inspector-Packer 6-66.913, B-535.

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
P	CB-1-A CB-1-L	75	P	Part 5 Part 7	75
T	CB-1-G CB-1-K	80	K	Part 8	85
M	CB-1-M CB-1-N	75	M	Part 9 Part 10	75

Effectiveness of Norms

The data in Table IV indicate that only 54 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 74 percent would have been good workers. 46 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 26 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Inspector-Packer 6-66.913.

II. Sample

During May 1962, the GATB, B-1002B, was administered to 52 workers employed as Inspector-Packers 6-66.913 by the American Lava Corporation, Chattanooga, Tennessee. Only four of the total group of 56 Inspector-Packers at this company did not volunteer to participate in this study. Of the 52 workers tested, two were eliminated from the final sample; one because of a physical handicap and one because of apparent senility. The final sample was comprised of 50 workers, one male and 49 females.

Individuals were selected for employment at the company primarily on the basis of an interview. Applicants in good general health, 18 to 35 years of age, and having 12 years of education are preferred. No tests had been used to screen applicants for employment and no previous experience was required. The minimum amount of training time for this job is approximately three months. All workers in the final sample have completed the training period and are considered experienced.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 50	M	σ	Range	r
Age (years)	43.4	7.5	31-62	-.405**
Education (years)	10.0	1.6	8-12	.100
Experience (months)	77.7	56.1	3-240	.130

**Significant at the .01 level

The results of USES research on the effect of aging on aptitude scores has indicated that after the age of 40, manipulative aptitudes decline sharply. The above significant negative correlation between age and the criterion is consistent with these results since manipulative aptitudes are related to on-the-job success as an Inspector-Packer 6-66.913.

III. Job Description

Job Title: Inspector-Packer (pottery and porc.) 6-66.913

Job Summary: Inspects, finishes, counts and packs, preparatory to shipment, ceramic pieces used in the manufacture of electronic and mechanical devices.

Work Performed: Receives oral instruction from supervisor or group leader regarding the manner of inspection and/or packing that is to be used. Inspects pieces visually for defects such as chips, cracks, pits, blisters, discoloration, spots, excess material, or improper machining, discarding defective pieces and reporting to supervisor the types of defects occurring frequently. Uses pre-set snap, ring, dial, plug or camber gages to determine the conformation of parts to specifications. Checks straightness of rods and tubes by rolling them over an inclined piece of plate glass. Inspects parts as they pass by on a conveyor belt and places defective parts aside. Holds parts under a magnification light unit and inspects for defects according to standard. Removes rough edges, marks, and other removable irregularities from fired ceramic pieces using sandpaper or finning tool. Counts pieces by hand or by weight on balance or ratio scales and records number of pieces on packing labels. Wraps pieces individually in cellulose wadding or other protective wrapping and/or places pieces in compartments of packing boxes. Closes, seals, and labels packing boxes and stacks packing boxes on table or floor for pick up. Reports unusual conditions to supervisor, observes good housekeeping and safety rules, and performs other duties as assigned.

IV. Experimental Battery

All the tests of the GATB, B-100 2B, were administered to the sample group.

V. Criterion

The criterion data collected consisted of two sets of independent ratings made by the first-line supervisor on USES Form SP-21, "Descriptive Rating Scale." A period of at least two weeks elapsed between the first and second ratings. The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. A reliability coefficient of .88 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final criterion scores of 37-73, with a mean of 56.6 and a standard deviation of 7.9.

VI Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Form Perception (P) - required in perceiving pertinent details of ceramic pieces during inspection and finishing activities.

Motor Coordination (K) - required in coordinating eyes and hands or fingers during inspection, finishing, counting and packing activities.

Finger Dexterity (F) - required in fingering pieces during inspection, finishing, counting and packing activities.

Manual Dexterity (M) - required in handling tools, gages or ceramic pieces during inspection, finishing, counting and packing activities.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 50

Aptitudes	M	σ	r
G-Intelligence	77.4	10.5	.140
V-Verbal Aptitude	83.9	8.9	-.007
N-Numerical Aptitude	75.4	14.2	.133
S-Spatial Aptitude	81.7	11.8	.054
P-Form Perception	79.7	16.3	.315*
Q-Clerical Perception	84.2	11.7	.402**
K-Motor Coordination	91.6	15.2	.472**
F-Finger Dexterity	95.4	15.8	.062
M-Manual Dexterity	89.3	16.2	.427**

**Significant at the .01 level
*Significant at the .05 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X		X	X	X
Irrelevant									
Relatively High Mean							X	X	X
Relatively Low Sigma	X	X		X		X			
Significant Correlation with Criterion					X	X	X		X
Aptitudes to be Considered for Trial Norms					P	Q	K	F	M

Trial norms consisting of various combinations of Aptitudes P,Q,K, F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of P-75, K-85 and M-75 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 46 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes P, K and M with critical scores of 75, 85 and 75, respectively, and the dichotomized criterion for Inspector-Packer 6-66.913. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Inspector-Packer 6-66.913
(P-75, K-85, M-75)

N = 50	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	10	17	27
Poor Workers	17	6	23
Total	27	23	50

Phi Coefficient = .37
X^2 = 6.810
P/2 < .005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes P, K and M with minimum scores of 75, 85 and 75, respectively, have been established as B-1002 norms for Inspector-Packer 6-66.913. The equivalent B-1001 norms consist of P-75, T-80 and M-75.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.